

CLAIMS

What is claimed is:

1. A system for adaptive functional composition of software components, to fulfill requests for higher-order functions comprising:
5 a catalog of system resources including tools, applications, web services, and data repositories each implementing one or more functions and constraint information relating to the system resources;

a constraint solver configured to select a subset of the system resources based upon the request and the constraint information in said catalog; and

10 a composer configured to optimally sequence the functions and cause execution of the sequence of functions based upon the selection of system resources by said constraint solver.

2. The system of claim 1, wherein said constraint information comprises: (i)
15 function hierarchies of abstract function comprised of primitive functions, and (ii) ordering relations between functions.

3. The system of claim 1, wherein:
said catalog comprises an abstract model of functions, their inter-relationships, and
20 their constraints;
said constraint solver is configured to determine one or more sequences of functions that satisfy all constraints of the selected system resources, and to generate a function graph based thereon; and

said composer is configured to generate a procedural process script from the function graph generated by said constraint solver.

4. The system of claim 3, wherein said catalog comprises metadata relating to
5 the functions included therein, and wherein said composer utilizes said metadata in
generating said procedural process script.

5. The system of claim 3, wherein said procedural process script is provided to a
process engine to cause execution of the selected sequence of functions.

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6. The system of claim 3, wherein said constraint solver is provided with a set
of decision variables that correspond to the system resources, and wherein it is configured to
determine an assignment of values for the decision variables that satisfies all constraints of
the selected system resources.

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7. The system of claim 6, wherein said constraint solver employs constraint
propagation to attempt to solve for the decision variables, and a search technique to find
values for any unsolved decision variables.

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8. The system of claim 7, wherein said constraint solver is configured to
determine a set of valid decision variables that correspond to primitive functions eligible for
inclusion within the subset of system resources, and to generate a path that traverses all of
the eligible primitive functions to generate said function graph.

9. The system of claim 1, wherein said constraints are processed by said constraint solver according to specific domains.

5 10. The system of claim 1, wherein said constraint solver utilizes a constraint satisfaction parameter to select said subset of system resources, and wherein constraint satisfaction may be relaxed or restricted to allow alternative selections of system resources.

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